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BIOGRAPHICAL NOTICE

OF

JOSEPH LE CONTE.

BY

S. B. CHRISTY,

PROFESSOR OF MINING AND METALLURGY, UNIVERSITY OF CALIFORNIA, BERKELEY, CAL.

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A black and white portrait of an elderly man with a full, white beard and mustache. He is wearing a dark suit jacket over a white shirt and a dark tie. The background is dark and out of focus.

Joseph Le Conte

Biographical Notice of Joseph Le Conte.

BY S. B. CHRISTY, UNIVERSITY OF CALIFORNIA, BERKELEY, CAL.

(Mexican Meeting, November, 1901.)

IN the death of Joseph Le Conte, at Yosemite, Cal., on July 6, 1901, the Institute has lost one of its most distinguished honorary members, and the University of California its most beloved professor.

The South has produced many distinguished men. In the law, in politics, and in war, they have made their mark, and we are all proud of their records. But in science not so many have achieved distinction. The Le Conte family is thus the more remarkable, in that it has produced three men of eminence in that field, while there are descendants of promise yet to be heard from.

It is always interesting to trace the influences that go to make a great life; and in this case I am able to draw upon an abundance of material in the manuscript autobiography which Prof. Le Conte completed shortly before his death. Through the kindness of Mrs. Le Conte, I am permitted to make such extracts as may be needed to give a glimpse of his remarkable life and character. This autobiography, together with other unpublished notes and sketches of his experiences during the Civil War, covers nearly 600 closely-written pages, and is one of the most fascinating stories I have ever read. It is to be hoped that it will be published entire; for, while it is written with all the frankness of the *Confessions* of Rousseau, it depicts a noble character without a trace of morbid self-consciousness, breathes a high philosophic spirit, and is enlivened with a fine sense of humor.

It is particularly interesting where it depicts a form of society that has now passed away forever:—the almost ideal life that existed in the cultivated families of the South before the war. This is described from the standpoint of a native who was, at the same time, one of the wisest and kindest of men,

able to observe with the trained eye of science, and yet to feel for the lowliest slave. I predict that this autobiography will take high rank among publications of its class.

Much of my information is derived from this source; and I shall endeavor, as far as possible, to let Prof. Le Conte's own words speak for him, since they will paint a picture better than any that I could outline.

Joseph Le Conte was born Feb. 26, 1823, at Woodmanston plantation, Liberty county, Georgia. His father's family were Huguenots, and traced their ancestry back to Guillaume Le Conte, born in Rouen, France, in 1659, who left Rouen in 1686, just after the revocation of the Edict of Nantes, and settled in New Rochelle. One of his descendants, William, took a prominent part in the revolutionary movement in Georgia. He was a member of the "First Council of Safety" in 1775, and was on the so-called "Black List" of "those Rebel Councillors," prepared by Sir James Wright and sent to King George III.

The second son of William, John Eaton Le Conte, was born in 1730. He had three sons: William, who died without issue; Louis, the father of Professor Joseph, the subject of this sketch, and of Professor John Le Conte, the physicist; and John Eaton, the father of John L. Le Conte, the distinguished naturalist.

Louis, the father of Joseph, was born in New York in 1782. He graduated at Columbia College, and then studied medicine, the better to care for the slaves on his father's plantation. He returned, at the age of 28, to Liberty county, which was a Puritan colony, and very orthodox and exclusive. In 1813, he married Anne Quartermain, one of these Puritans, and a refined and lovely woman. They had four sons and three daughters, of whom Joseph was the fifth child and youngest son. Two of these sons died in early manhood, and both of the others became distinguished men.

Joseph's mother died when he was only three years old, and he was brought up by his father with the most tender care. This father was a very remarkable man: a good physician, a skillful chemist and naturalist, a great hunter, fond of all manly sports, and a passionate lover of nature. Young Le Conte owed much to his father's training; but he was partly prepared for college by Alexander Stephens, who entered into all the

sports of his pupils, and strongly impressed them with his own intense hatred of lying and all forms of deceit. His training for college comprised the "Three R's," Latin and Greek through Livy and Xenophon, and mathematics through algebra and geometry.

His life on the plantation at that time was an ideal one; and, as one reads his description of it in his autobiography, one cannot but regret the passing away forever of a stage of civilization that made such an existence possible. It was an admirable training for the future lover of Nature. Hunting, fishing, boating, swimming, riding, were constant sources of enjoyment and profit. In all forms of athletics he was wonderfully proficient. Of a slight but wiry build, he was capable of performing many feats of strength and agility better than many strong men of nearly double his weight. He says of himself:

"Now, at 77 [a year before his death], swimming is still as easy as, and I think a little easier than, walking. Slender, with long limbs and small bones, I have very large lungs, and can inhale over 300 cubic inches of air; hence my body is much lighter than fresh water. I can lie motionless, breathing perfectly naturally, for any length of time; and, in fact, I believe that I could go to sleep in the water."

Swimming was by no means always a safe recreation on the plantation, on account of the alligators. The boys didn't much mind the small ones, say up to six feet or so; but the old ones were considered dangerous, and he mentions with great delight the capture of a big one, 14 feet long, which, with a hooked pole thrust down its throat, took 25 negroes to drag from its hole.

At 14 he was prepared to enter college, but it was wisely decided to have him wait a year; so at 15 he went to college at Athens, Ga., and graduated in 1841. Of this period, he writes:

"I may add, here, that for me the so-called dangers of college-life never existed. I saw much of vicious conduct among students, of course; but whether such example injures or not depends entirely on inheritance and early training. For myself, I never felt the least temptation to join in vicious courses, nor have I ever been enticed by others to do so. College-students are not so bad as some seem to think. They never deliberately try to lead anyone astray. They simply seek congenial association. Indeed, I believe that college is the safest place in the world for young men. It is impossible always to remain in the bomb-proof of home. One must go out into the world and fight the battle of life. Now, collegemen are a picked set, far safer than the average."

While in college, he never touched cards or liquors, although later, as a man, he was accustomed to use wine at table.

"Instead of sowing any wild oats and reforming afterwards, I have steadily become more and more liberal in my thoughts and feelings about such things. This is as I believe it ought to be. Vice is mere *weakness*. Evil consists in mere *abuse*. Now, in youth, strength is not yet acquired; rational use is not easy, and therefore had better not be attempted, except under the shelter of the home-roof."

"Refined ladies to me then—and I confess to something of the same feeling yet—were superior beings, belonging to another and higher and purer existence. I simply worshipped them. Association with them produced in me a delicious delirium, an ecstatic joy and exaltation. I have much of the same feeling yet, though modified and purged of its extravagance by experience. In these days it has become the fashion to ridicule this romantic feeling toward woman; but there can be no doubt it is the greatest of all safeguards of the purity of young men."

He delivered a Junior oration in 1840 and the Senior oration in 1841. Of these productions he says:

"To show the double tendency of my mind toward Science and Moral Philosophy, the title of one was "True Greatness," which I took to be mainly *moral worth*; of the other, "Love of Truth the Highest Incentive to Effort." Both of these I burned many years ago, in disgust of their almost childish crudity and immaturity. I wish now I had preserved them. We grow more tolerant as we grow older. The fact is, my ability to write anything of value came very late. I never was, and am not now, a facile writer. To me a written production of any kind is literally a piece of thought-work. It is not, however, a manufactured article, but a *child* of the brain. It is not *made*, but *born*—born of much labor and with many throes. Of course, therefore, I never write until I have independent thoughts of my own."

I have already referred to the strong religious strain in his ancestry, Huguenot on the one side and Puritan on the other; and I mention another important epoch in his life, in his own words, as it sheds a strong light on the subsequent interest he always took in the religious bearing of the theory of Evolution, and his determined purpose to find a solution for the apparent conflict between science and religion:

"During a religious revival in the churches, when I was in the Junior class, Lewis (a brother) and I joined the church. Our church at Midway, Liberty co., was Puritan Congregationalist. There was no church of that kind at Athens. The nearest to it in faith was the Presbyterian. My friends did not think it well to wait till we returned to Liberty. The Presbyterian was good enough. Thus it was that I became a Presbyterian instead of a Congregationalist. Indeed, the history of our family was peculiar in this regard. My ancestors were, of course, Huguenots by blood and faith. In early colonial times the Huguenot church in New York became at one time so weak, financially, that it was compelled to save itself from extinction by putting itself under the protection of the English Colo-

nial Government, and became Episcopal. It so remained ever in New York. The old Huguenot church in which are recorded the births, deaths and marriages of my ancestors back to the original Guillaume—the Eglise de St. Esprit—is still a French Episcopal church. It has now been moved up to 27th st. On coming to Georgia, where there was no Episcopal church, my father attended regularly the Congregational church at Midway, of which my mother was a member, and of which my elder brother and sister were also members. My father never connected himself with the church, although all his children were baptized there. Circumstances already mentioned connected Lewis and myself with the Presbyterians. It is not strange, then, that, with such a family history, I cared little for denominational differences. Of my own children, one is a Presbyterian, two are Episcopalians, and one is not a member of any church; and he is as good, for all I can see, as any of them.

“This revival and my union with the church was undoubtedly a very great crisis in my life. If there ever was a sudden, almost miraculous conversion, mine was one. I passed through all the stages described in such cases—*i.e.*, a period of great distress, of earnest prayer, of exercise of faith, sudden sense of acceptance, intense ecstatic joy for deliverance, and trust and love of the deliverer. The sense of fatherhood of God and brotherhood of man was vivid and full of delight. Life took on a new and glorious significance. All men became dearer to me, and even Nature assumed a new and more beautiful appearance. Literally, there was a new heaven and a new earth. The sky was never before so blue, the clouds so grandly massy and white, the grass so freshly green, nor the stars so bright. The sense of joy was so great that my breast seemed to swell almost to bursting. But the real permanent change was a sense of deliverance from the bondage and the fear of death and the hereafter which, under the spell of the old orthodoxy, had always, in thoughtful moments, oppressed me. My spirit was set free. I was now the child of God and the brother of Jesus. I had now a really noble object in life—an ideal to be sought—an evil to be fought against. This I have never lost. It has been the most powerful element in the formation of character and in the determination of conduct. However much I may have changed my opinion as to the miraculousness of the process, this change of relation toward the spiritual world has remained as an eternal heritage. Delusion! some will say. No—it was the old fear that was the delusion. The change was not the establishment of a new relation, but the establishment of the true relation which already existed.”

He was strongly urged, about this time, to become a preacher of the Gospel. He adds:

“At that time I did think very seriously of it; but my scientific tastes prevailed and carried me towards medicine instead, and I have never regretted it. One may be a preacher of righteousness in more ways than one.”

He graduated at Athens, Ga., in 1841, at 18 years 5 months. There was then no opportunity to study nature for its own sake, and as the nearest approach to it we find him, in 1843, a student of medicine in the College of Physicians and Surgeons in New York. In the summer of '43-4 he took a trip of several months, with one of his cousins, right into the heart of what was

then a wilderness, inhabited only by Indians and Indian agents. His course took him through the Lake Superior country (at that time just being prospected for copper) into Canada, and then down the Mississippi river, long before such towns as Minneapolis were founded. His journal of this trip reads like the story of Robinson Crusoe, and is full of interest; but I give only the following incident to show the spirit of the boy then, and of the man who always seemed to keep the springs of youth fresh within him:

“What a glorious swim I took in the roaring cataract that afternoon!* Some 29 to 30 Indians, men and boys, had come from Fond-du-lac to visit our camp. As I went down the cataract with railroad speed they watched me with the greatest interest, cheering when I passed, and screaming with delight when I came out victorious. I bantered them to join me, but neither entreaty nor jeering would induce them to try. I went down repeatedly (walking up by land each time), leaping and playing in the roaring torrent, laughing and screaming with delight.”

This trip left a great impression upon his mind. He made *en route* a number of geological observations (the importance of which he was then too young to realize), which were afterwards confirmed, and more fully appreciated, by other observers.

In 1845, he graduated from the medical school, and settled down as a practicing physician in Georgia.

On January 14, 1847, he was married to Caroline Elizabeth Nisbet, the daughter of Alfred M. Nisbet, Esq., at Midway, near Milledgeville, Ga. This marriage proved a very congenial one, and has occasioned the following eloquent lines, which, written at 77, a year before his death, and after half a century of wedded life, show the warmth of his nature, the soundness of his judgment, and the happiness of his experience:

“I have referred to love and marriage as the second great crisis in my life. There may be love with marriage, and, alas! marriage without love. These two, love and marriage, are necessary supplements of each other, and must be combined to afford the highest spiritual growth. Love, *romantic love*, inflames the imagination and æsthetic sense, kindles the sense of beauty in the human person, in art and literature. But this is not enough. Marriage is necessary to bring about another kind of love—of the heart and the affections—*unselfish, self-effacing love*. The first grows up quickly, but as quickly sheds its flower-like beauty after marriage, unless supplemented by wedded love, which continues and grows to the end of life, not destroying, but only chastening, the extravagancies of the former. The one may be likened to the Greek spirit, with its intense love of beauty, intense

* At the Dalles of the St. Louis river.

enjoyment of life, physical and temporal, but adding to it the apotheosis of woman, which it derives from the Teuton. The other may be compared to the Christian spirit of self-sacrifice, but adds also the apotheosis of woman as virgin-worship. The one must not displace, but supplement the other. The two, the Greek and the Christian, must be united. They are united in every true marriage. They are becoming so in every enlightened modern society."

In the practice of medicine he was moderately successful; but his heart was not in the work. He felt, probably, more keenly than most, the responsibility for the life of his patients, and the lack of preparation which the medical training of that time gave for what he himself terms "the awful responsibilities of a medical practitioner." Then, too, it was characteristic of the man to shrink from practical details; they did not interest him; his nature reached out to solve the larger problems of the mind. He had at this time three medical students, and teaching them interested him far more than the practice of medicine. He confesses to having felt a strong sense of wasted life, though he carefully concealed it from all, even from his wife.

Richard Owen, the comparative anatomist, first interested him in the "homologues of the human skeleton;" and this led him to decide, shortly after (in 1850), to become a pupil of Agassiz. He went to Cambridge in August:

"The University does not open till October. But that does not matter. I did not come to Harvard to enter the University, but only to study with Agassiz, and we (Dr. Jones and myself) went right to work. The first work he put us at was very characteristic of the man. He thought a moment, and then pulled out a drawer containing 500 to 1000 separated valves of *Unios*.

"There were 50 to 100 different species, all mixed up. 'Pair these valves,' said he, 'and classify into species—names no matter—but separate in species.' He left us alone—very severely alone. We worked on these shells for one whole week. He looked at the work from time to time, but made no remark. Finally, we told him we had done the best we could. He examined carefully, and was greatly pleased. It happened just then that there entered the room a friend of his, just from Europe, M. Ampère, son of the great electrician. He introduced us, and remarked that these pupils of his had just amended correctly the classification of Lea, the great authority on *Unios*.

"I only give this as an example of his method of teaching. He constantly carried it out, with some modifications. He set us tasks; we worked unaided, with only a hint here and there. As we became better acquainted, however, finding us already well-advanced in thoughtfulness, he often gave us long talks, expounding his biological philosophy, and inviting discussion, which we were not slow to accept. He thus scattered unpublished thoughts and suggestions broadcast on all sides with a free hand."

"There are two types of great men. Men of one class are great by the quantity and importance of their work; but when you come in contact with and measure

them intellectually, they seem of ordinary stature. Their work is greater than themselves, though surely patience and persistence are admirable qualities which ought to be added to their work in estimating their greatness. Those of the other class, the nearer you approach them the greater they grow. They are themselves greater than all their visible results. These are the great teachers. Their spirit and enthusiasm are contagious, their personality is magnetic. They not only think intensely, but they are the cause of thought in others. Agassiz was pre-eminently of this class."

Later, he joined Agassiz in his famous trip to study the coral-reefs of Florida, and he gives the following very interesting reminiscence, showing the nervous pressure under which this great teacher worked:

"The collections were enormous, for the whole population, especially the sailors, 300 to 400 in number, collected for Agassiz. The keen delight, the almost childlike glee of Agassiz, when anything new was brought him, pleased these children of nature immensely. 'One touch of nature makes us all akin.'"

"I never saw any one work like Agassiz—for fourteen hours a day working under high pressure, and smoking furiously all the time. The harder he worked, the faster he consumed cigars."

It is, perhaps, not surprising that Agassiz had a nervous breakdown soon after. He was probably, even then, showing its first symptoms.

A year later (in 1852) Le Conte accepted the Professorship of Science at Oglethorpe University, Midway, Ga. He was expected to teach all the sciences except astronomy, which went with the chair of mathematics. For \$1000 a year he actually did teach mechanics, physics, chemistry, geology and botany. A year later, he was called to a better position in his own university at Athens, Ga., where for five years he was able to confine himself to natural history, though he had to teach French for a year. In 1857 he was called to the Professorship of Chemistry and Geology at South Carolina College, Columbia, S. C., where he remained till after the war.

Speaking of the outbreak of the war of '61, he says:

"At first I was extremely reluctant, and even opposed to the movement. I doubted the necessity of secession; I dreaded the impending conflict and the result. A large number of the best and most thoughtful men in the South felt as I did. But gradually a change came about—how, who can say? It was in the atmosphere. We breathed it in the air; it reverberated from heart to heart; it was like a spiritual contagion—good or bad, who could say? But the final result was enthusiastic unanimity of sentiment throughout the South. Those who were the latest and the most reluctant, because they saw the seriousness of the result, were

also the most earnest and most reliable. Those who did not join in the movement (with very few exceptions, like Pettigrew) were untrue men in every way, both North and South alike. Copperheads and scalawags, with some exceptions, were alike untrue. I spoke of Pettigrew as an exception. Pettigrew from the first, and throughout the war, was always a Union man. He spoke openly, never concealing his opposition to secession. He said the State was demented, but submitted quietly and sorrowfully. Every one accepted his views and had the greatest confidence in his integrity. He loved the State, but believed she was rushing on ruin. After the war, the confidence of the State was shown by giving him the codification of the laws."

Prof. Le Conte carried on his teaching till the college was disbanded, as the war became more desperate, and then offered his services to the Confederates, and was employed as chemist and geological expert in the search for deposits of nitre and the manufacture of explosives. He suffered all the horrors of war except death in his immediate family. For three years he had the barest and coarsest of food, never tasting tea, coffee, or sugar for that time, and, strange to say, though fond of them, hardly feeling their loss. At the end of the war, like many others, he was in rags, and was compelled to wear the uniforms of Federal soldiers who had died in the hospitals; for cloth, and even its raw materials, had practically ceased to exist in parts of the South. All his property was gone. His Georgia home had been in the path of Sherman's army, and everything he possessed except the land was gone. At one stroke of the pen, the Emancipation proclamation had taken from him something like \$75,000 worth of slaves. But at this last loss he was not disposed to grieve. He had inherited his slaves, and for a long time his family had neither bought nor sold any. They had regarded their slaves as wards for whom they were responsible, rather than as mere chattels. His father had actually studied medicine the better to look after their welfare, and the son had felt that he ought to do the same thing. This he could only do by sacrificing his ambition for a scientific life—a sacrifice to which he had not brought himself; but still the care of those slaves had always been a weight upon his conscience. Hence, though in financial distress, he was really relieved when this weight was gone.

Regarding the actual loss to the South from the emancipation of the slaves, Prof. Le Conte maintained at the time, and always afterwards, that it was not necessarily a loss like that due to the burning of a house. He pointed out that

"Where the black labor remains reliable, and the management is judicious, the land makes as much as ever it did, and the owner is as rich as ever he was; he has suffered no loss. . . . But in some places the labor continues to be utterly unreliable. This is especially true of the so-called 'black belt,' where the blacks are greatly in excess, and still more especially true in Liberty county, Ga., where my own landed property is situated. I have there more than 2000 acres of land, half of it rich land. It has never made me one cent since the war. The negroes will not work for wages. They can live on fish, crawfish and oysters, almost without work. A little patch of cotton will make more tobacco and coarse clothing than they can use. They have no ambition to improve, and live almost like animals. The whites have nearly all quit the country and gone somewhere else. The whole lower and richer part of the county is practically given over to the blacks."

In this connection, in view of the still unsettled state of the race-question in the South and the very large addition to our race-problem that has come to us as a result of the Spanish war, it is worth while to mention a paper by Prof. Le Conte, entitled "The Race Problem in the South," which was read before the Brooklyn Ethical Association and published in a volume issued by that society, entitled "Evolution: Man and the State." (New York: Appleton & Co., 1892, pp. 349-383.) This paper was written from a personal knowledge of the question, and brought to bear on the problem the laws of evolution, as applied to the study of race-contact and survival. He first shows that the problem is not soluble by race-blending, for the simple reason that the blend is sterile. He then goes on to show that when two races that cannot blend are brought into intimate contact, so that they cannot escape from each other, there are two possible solutions—the extinction of one, or the management of the governmental policy by the superior race. He illustrates this by the example of a thousand adults and a thousand children of their own race upon a desert island. No one would think that the children should govern. Their very safety depends on government by their wiser seniors. Suppose, now, instead of the one thousand children, there should be substituted one thousand adult savages; peace could only come by the extinction of one or the other of these races, or the submission of the inferior to the government of the superior race in the common interest. He contends that education and a moderate property-qualification should be made the indispensable requirements for suffrage. And he observes that, for the lower classes, the latter is perhaps the more important of the

two, as it indicates the presence or absence of certain moral qualities, such as industry, thrift and self-control, indispensable qualifications for citizenship. He remarks, elsewhere, that, shortly after the war, when an income-tax was enforced in South Carolina and his only income was his salary of \$2000 per year, he was taxed 5 per cent., or \$100; and *that this tax of \$100 was more than was paid at that time by the entire Legislature (mostly composed of negroes), who made the laws for the State!* Among other acts, this Legislature passed a law admitting all negroes to the University without any qualifications!

This is not the place for any discussion, or even for an expression of personal approval, of the views of Prof. Le Conte on such a subject. They have been given in the foregoing condensed statement as a necessary part of any complete picture of the man. But it is not improper to call attention to them as a contribution to pending discussions from an exceptionally sincere, keen, wise and kindly observer.

In 1869 Prof. Le Conte left Columbia to accept a call to the University of California, whither his brother John had preceded him a year before. He was expected, at first, to teach, alone and without assistants or laboratory appliances, botany, zoology and geology. He was compelled to give his instruction entirely by lectures. This he he did for many years; and he developed a method of lecture-instruction that has probably never been excelled by any teacher of these subjects. Later, he was relieved from the heavy task of carrying these three subjects, and confined his teaching entirely to geology. But it was doubtless fortunate for his students that he taught these related subjects for so many years; since otherwise his wonderful grasp of the doctrine of organic evolution would have been impossible. As it was, he welded these three subjects, zoology, botany and geology, all studied by the comparative method, into an organic unity that made a never-to-be-effaced impression on all his hearers.

It was probably for him, and certainly for California, fortunate that he came when he did to the State University. One can best understand this from his own words:

"I have said that my intellectual activity was powerfully stimulated by my coming to California. There were many reasons for this: First, the reaction from the long agony of the war. Abstract thought was almost impossible, for

anxiety during the war, and the presence of its ruinous results afterward. Second, the splendid field for geological research offered here. Third, contrary to my expectations, I found here an exceptionally active, energetic, and intelligent population. What California wanted then (and still to some extent wants) is a more thorough organization of society—an organized public opinion—conventions, traditions—with them, wholesome restraining influences on the weak and the vicious. But the strong and the virtuous do not need these—indeed, are perhaps better without them. Family and name have little influence here; every man must stand on his own merits.

“I threw myself into my work with all my energy. I enjoyed my teaching intensely, and this made my teaching correspondingly interesting to my students. I never tire of my subject. Although I have gone over my course in geology now fifty times, I am still as interested in it as ever. Although the whole subject is perfectly familiar to me, I never enter my lecture-room without two hours’ intense preparation. I must revive my interest, I must get up steam. I am firmly convinced that investigation ought never to be separated from teaching, as many suppose,—that not only is one a better teacher from being an investigator, but he is also a better investigator for being a teacher. Nothing so clears up the thought as the earnest attempt to make it clear to others by personal address. Almost every good thought I ever had came first into my mind during the heat of direct preparation for my class-lectures. Nearly everything I ever wrote was first given in my class-room, and written out and perfected afterward. Whatever success I have ever achieved in teaching has been the result of my intense interest in my subject and in my students.”

As one of these students, I can well testify to the truth of the above lines. Daily, for years, have I seen his agile figure eagerly stepping off for a brisk morning stroll of half an hour. To the last he kept his physical vigor and activity through attention to the laws of health. At nine, with his blood in active circulation and his lungs full of the freshness of the morning, he shut himself up alone in his study and paced slowly up and down, reviewing those beloved notes of his—long, narrow sheets of pale brown paper, inscribed with a logical framework of ideas to build on.* Then, at eleven, he appeared before his class, full of the inspiration of his great theme. It was no wonder that he carried all his hearers with him. His afternoons were given to writing, and his evenings he reserved, as far as he could, for general reading. It is to the honor of the Regents of the University that, despite many

* Certain peculiarities of his style as an author are probably largely due to his habit of constructing these lecture-notes as a framework for his discourses. For instance, his liberal use of capitals and italics. This probably came about, to some extent, at least, through the necessity of emphasizing certain words and phrases in order to catch the eye, and the very natural extension of this habit into his written productions.

financial stringencies, they relieved his energies from the drudgery with which so many college professors are loaded, and enabled him to live out his long life and use his great abilities to the best advantage.

I well remember the first time I heard him lecture: it was in the basement-hall of one of the local churches. As I wandered down the steps, my ear was touched by a thin, rather high-pitched voice, vibrating like a high-strung but clear and true violin string. It was a voice of wonderful flexibility, and it followed with perfect naturalness every phase of his theme. The peculiarity of the voice impressed me even before I had seen the speaker. But I stopped to listen; and I forgot the voice in the theme.

Many times (and with new pleasure every time) have I heard him repeat an address often delivered before; and I have noticed that he used almost the same words on each occasion, though his notes were never written out in full, and there was no attempt at memorizing. His subject was so thoroughly thought out, so entirely his own, that the best words naturally suggested themselves to his mind at the right moment. There was no striving after effect; all was the result of intense interest and thorough mastery of his subject.

Never a controversialist, he was forced to write one of his best books simply to correct the errors of others. These were no less men than Wiedemann, Helmholtz and Clapeyron, Tyndall and Raoul Pictet. He had peculiar power in controlling the muscles of the eyes, and singular acumen in analyzing their observations. When still a young man, he saw a stereoscope for the first time, and listened to his older scientific friends, exclaiming, as they viewed it, on the remarkably beautiful demonstration which it furnished of the correctness of the then accepted Wiedemann theory of binocular vision. When his turn came to examine the instrument, he noticed that, if he focused his eyes on the near lines in the figure, the far ones disappeared, and *vice versa*, and perceived that this was in direct opposition to the Wiedemann theory. His remark, "Yes, it is beautiful; but it disproves the Wiedemann theory," was received with incredulity; but he lived to see his views accepted. Though not at first greatly interested in the subject, his peculiar powers of vision enabled him to detect, one after another, the

faulty interpretations of the many distinguished physicists who attempted the problem, until his many papers grew at last into his volume on "Sight," now the accepted authority on that subject, which exhibits his capacity of careful analysis and resources of a high order in the conduct of experimental investigation with simple means.

No one can have followed even this brief outline of his life without feeling the breadth of his training and the wide outlook of his sympathies. But our Institute looks upon him chiefly as a leader in geological science.

His first geological studies date back to that long trip to the Lake Superior region, where he was present at the first opening-up of the copper-mines; but even then he was more interested on the scientific than on the technical side. His work with Agassiz on the coral reefs of Florida gave another impetus to his tastes. His search for niter-deposits for the Confederate Government, during the dark days of the war, brought him into the practical branch of our profession. But his coming to California, then a virgin field to geologists, inaugurated a new era in his life.

In his vacations he ranged the foot-hills and the Sierras of California, the Cascades of Oregon, and then into British Columbia. He visited the Comstock mines of Nevada in their prime. He first noted the extent and significance of the great Columbia lava-flood that stretches down into northern California. He developed and perfected his theory of mountain-formation, and worked out a number of important problems in California geology. Perhaps our greatest interest attaches to his studies in the origin of metalliferous veins. His visits to Virginia City, Nev., to the California gold-veins and auriferous gravel-deposits, and, most of all, to the Sulphur Banks, Cal., and Steamboat Springs, Nev., where traces of cinnabar (and, in the latter, also gold, silver, and copper) were still being deposited, stimulated his interest to the highest pitch. I well remember that, two years before this time, I was particularly interested in studying the cinnabar-deposit at New Almaden, and had come to the conclusion that it could not have been formed by the sublimation of the cinnabar, as was then commonly supposed, but must have been deposited from solution. I shall never forget his delight when I brought him a beautiful, solid mass of crystals of artificial cinnabar that I had produced in

the laboratory by the action of a superheated solution of alkaline sulphide on the black amorphous sulphide of mercury. He was more rejoiced that one of his students had made this discovery than if he had made it himself. When, later, he was able to catch nature in the act, as it were, at Steamboat Springs and Sulphur Banks, his satisfaction was complete. His interest in this subject never waned.

The world is certainly indebted to him for his "Elements of Geology," which presents the subject, stripped of every needless technicality, so as to make it interesting to every intelligent reader. I do not know a book in any language which so clearly opens the delights of the science he loved best to the beginner; and anyone who has imbibed its spirit has drawn a lesson from the book of nature which will always give to life new meaning and interest.

He was much interested in the remarkable fossil footprints that had been discovered in some sandstone-beds. Dr. Harkness and others had claimed that some of these had been made by prehistoric men. Prof. Le Conte examined them with Dr. Harkness and several others, and each wrote a paper, Dr. Harkness arguing in favor of the human origin, and Dr. Le Conte against it. It is needless to add that the latter view is now accepted. The following interesting observations were made at this time by Prof. Le Conte concerning the convicts who were employed in blasting out fresh exposures in the formation:

"While here, my observations on criminals interested me greatly. They enjoyed the work and the investigation immensely and very intelligently. We were all working together, and all intensely interested together. We entirely forgot that they were criminals, and some of them murderers. We were all simply fellow-men, and for the time companions. For all we could see, they were much like average men, neither better nor worse. The effect of the work-sentiment on them was wonderful. Before sullen and dull, now bright, eager, cheerful and happy. What a reformatory measure such work would be, if it could be continued indefinitely!"

But it is probably as a teacher of the new gospel of Evolution that Prof. Le Conte will be best remembered. He was not one of the first to accept it. As a disciple of Agassiz, who never accepted it, he at first was strongly opposed to it; but the more he studied it, the more he attempted to explain it to his

students, the more its importance was forced upon him. His strong religious nature made him weigh it in the balance, lest it might contain some flaw, or unhappily undermine the religious faith of some tender youth. I myself remember his early reservations in dealing with the subject; but year by year these became fewer and fewer, until at last, when all became clear to him, he became the truly inspired teacher, the voice of John the Baptist in the wilderness, crying out, "Prepare ye the way of the Lord, make His paths straight." No religious service could have more of reverence in it, or a deeper sense of contact with the infinite possibilities of life and death, than those lectures of his on Evolution.

The way his famous book on "Evolution" came to be printed is also interesting. Henry Ward Beecher had just become a convert to the new view, and, with characteristic courage and promptness, one of its most ardent advocates. Somewhere about '85 he came to California on a lecture-tour. Mr. Sherman Day, of Berkeley, a neighbor of Prof. Le Conte, asked him for copies of some of his papers on Evolution, to give to Mr. Beecher. After reading them, Mr. Beecher wrote to Prof. Le Conte (personally unknown to him at that time), urging him to write a book on the subject, saying, indeed, that he owed it to the world to do so. Prof. Le Conte had often thought of doing so, but shrank from the task—rather from the abundance of material than the lack of it. But this appeal decided him; and a couple of years later the book was finished. He says of it:

"Its success exceeded my utmost expectation. The intelligent public seemed to have been waiting for such a book, especially the third part, *viz.*, 'The Relation of Evolution to Religious Thought.' Since its publication I have received letters from clergymen personally unknown to me, and of every denomination, thanking me for the boldness and yet the temperateness of the book. I have also received letters—thirty or forty—from young men personally unknown to me,—young men of high intelligence, many of them scientific,—from all parts of the United States, thanking me for a book which had saved them from rank materialism. I have also received letters from England, France and Italy, from men of the highest distinction. There can be no doubt that the book was timely and has done much good."

I remember meeting, at the home of a distinguished orthodox clergyman in Berkshire county, Mass., shortly after the book was published, the president of one of the most orthodox

colleges in America, himself an eminent clergyman. When he learned that I was from the University of California, he at once spoke with the greatest admiration of this book. I asked him if he accepted its conclusions, and was much surprised to hear him say, most emphatically, that he did; and then he added: "*I regard the book of Genesis simply as a charcoal-sketch, and we must look to Science to fill in the outlines of the picture!*" Truly the point of view has changed for the better in the last decade; and no one has contributed more to bring about this result than Joseph Le Conte.

It would be out of place for me to make a critical estimate of his work, even if I felt equal to the task; but I give, instead, his own modest estimate of it, as furnished in his autobiography—which is certainly an underestimate.

"Now, looking back over a long life of incessant activity, what have I done of value to the world? What have I added to human thought? What influence for good may I hope to leave behind?

"I. *In Science.* To touch only on the most important points:

(a) My paper in '59, 'On Correlation of Vital and Physical Forces,' I think, gave both impulse and greater definiteness to scientific thought on that subject. Carpenter, in the last edition of his *Physiology*, gives me credit for distinct advance on this subject.

"(b) My researches on the phenomenon of Binocular Vision, I am sure, did clear up the thought in this field. I claim, and have been generally accorded, the credit of several original thoughts which have remained the permanent possessions of science: (1) Demonstration of the real nature of the Horopter. (2) Demonstration of the true theory of binocular perspective. (3) Demonstration of certain fundamental psychical phenomena in binocular vision, and a new mode of diagrammatic representation based thereon. These phenomena had been observed by some, but not understood. Their explanation had been hinted at by others, but never clearly brought out before. (4) Certain peculiarities of phantom-planes not explained before.

"(c) In geology, I believe some real substantial advance in science was made in my series of papers: (1) On the Structure and Origin of Mountain Ranges. (2) On the Genesis of Metalliferous Veins. (3) Especially those on the Critical Periods in the History of the Earth. (4) The demonstration of the Ozarkian, or, better, the Sierran, epoch as one of great importance in the history of the earth. I might mention several others that I believe are of prime importance; but I am willing to stand by these.

"(d) In Biology, my views on Glycogeny, although not yet certain, have undoubtedly contributed to clearness of scientific thought on that important subject.

"II. *In Philosophy.* I look back with especial pleasure on my writings on Evolution. I lay no claim to the discovery of new facts bearing on the theory of evolution, but only to have cleared up the nature and scope of evolution, and especially to have shown its true relation to religious thought. It is well to stop a moment, to show the different rôles of different thinkers on the advance of this

subject. Leaving out of account mere vague philosophic speculations like those of ancient philosophers, and those of Swedenborg in modern times, I would say that the rôle of Lamarck was to introduce evolution as a scientific theory. The rôle of Darwin was to present the theory in such wise as to make it acceptable to, and accepted by, the scientific mind. The rôle of Huxley was to fight the battles of evolution, and to win its acceptance by the intelligent popular mind. It was the rôle of Spencer to generalize it into a universal law of nature, thereby making it a philosophy, as well as a scientific theory. Finally, it was left to American thinkers to show that a materialistic implication is wholly unwarranted—that it is entirely consistent with a rational theism, and with other fundamental religious beliefs. My own work has been chiefly in this direction. In my lectures in 1872 on ‘Religion and Science,’ I might be called a reluctant evolutionist; yet, even then, in the 16th chapter of my book, I try to show the mode of origin of the spirit of man from the *psyche* of animals by a process of evolution. In a few years, however, I was an evolutionist thorough and enthusiastic—enthusiastic not only because it is true, and all truth is the image of God in the human reason, but also because, of all laws of nature, it is by far the most religious, *i.e.*, most in accord with religious philosophic thought. Indeed, it is glad tidings of great joy which shall be to all peoples. Woe is me if I preach not that gospel! Literally, it can be shown that all the apparent irreligious and materialistic implications of science are reversed by this last child of Science—or rather this daughter of the marriage of Science and Philosophy. During all my life I have striven earnestly to show this. My book on ‘Evolution and its Relations to Religious Thought’ is the embodiment and result of these strivings, although I believe that, if I wrote it again, I could add much to the argument. I commenced this line of thought in 1871, I believe, and therefore claim that I was the pioneer in this reaction against the materialistic and irreligious implication of the doctrine of evolution. I can look back on this with greater pleasure than on anything else I have done. At first I suffered some (not much) obloquy on the part of the extreme orthodox people; but I have lived to see this pass away, and all intelligent clergymen coming to my position.

“All, or nearly all, my philosophic writings are more or less connected with the doctrine of evolution; and I regard these as among the most important of my writings. Indeed, my good friend Prof. Howison thinks that the best and most permanent that I have done is in the domain of philosophy, not in that of science proper. But then he is a philosopher; perhaps my scientific friends think differently.”

If one were asked to characterize his activities in a single sentence, it could be best done in his own words:

“The domains of Science and Philosophy are not separated by hard and fast lines; they largely overlap. It is in this border-land that I love to dwell.”

Perhaps one of the most interesting of Prof. Le Conte’s addresses was the one he delivered before the Philosophical Union of the University of California, at its public annual meeting in 1895. The address of the evening had been on the theme, “The Conception of God,” a book written by Prof. Josiah Royce, of Harvard University, who had been, as an

undergraduate in the University of California, a pupil of Prof. Le Conte. This book had been the subject of study for some time by the Union. On this occasion Dr. Royce had delivered an address on the subject, and there had been comments and discussion by Prof. Mezes, of the University of Texas (also a former pupil of Le Conte), and our own honored Professor of Philosophy, George H. Howison. The discussion, listened to by an audience of over a thousand, had been an intellectual contest of the most brilliant kind. In striking contrast to the methods of the philosophers were the remarks of Prof. Le Conte, which, however, held his audience from the first to the last, and produced a profound impression.

I had met him that afternoon on the college steps, and had thought, regretfully, that he was beginning to look a little worn. But that night, as his slender, graceful figure appeared upon the stage in evening dress, with his great head of snowy hair shining like a halo about him, he seemed as one inspired. I wish I could give his whole argument; but I must content myself with his introduction and his conclusion. He began:

“I can only admire, not criticize, the subtle method of Prof. Royce in reaching the conclusion of the personal existence of God. I have my own way of reaching the same conclusion; but, in comparison, it is a rough and ready way. His is from the point of view of the philosopher; mine from that of the scientist. I am not saying that his is not the best and the most satisfactory, but only that it is a different way. He has given you his; I now give you, very briefly, mine—as I have been accustomed to give it.

“Suppose, then, I could remove the brain-cap of one of you, and expose the brain in active work—as it doubtless is at this moment. Suppose, further, that my senses were absolutely perfect, so that I could see everything that was going on there. What would I see? Only decompositions and recompositions, molecular agitations and vibrations; in a word, *physical* phenomena, and nothing else. There is absolutely nothing else to see. But *you*, the subject of this experiment, what do *you* perceive? You see nothing of this; you perceive an entirely different set of phenomena, namely, consciousness,—thought, emotion, will, *psychical* phenomena; in a word, a self, a *person*. From the *outside* we see only a physical form, from the *inside* only psychical phenomena.

“Now, take external nature—the Cosmos—instead of the brain. The observer from the outside sees, and can see, only physical phenomena; there is absolutely nothing else there to see. But must there not be in this case also, *on the other side*, psychical phenomena—consciousness, thought, emotion, will—in a word, a Self, a Person? There is only one place in the whole world where we can get behind physical phenomena—behind the veil of matter, namely, in our own brain, and we find there a self, a person. Is it not reasonable to think that if we could get behind the veil of Nature we should find the same, that is, a Person? But, if so, we must conclude an Infinite Person, and therefore the only complete person—

ality that exists. Perfect personality is not only self-conscious, but *self-existent*. Our personalities are self-conscious, indeed, but not self-existent. They are only imperfect images and, as it were, separated fragments of the Infinite Personality God."

He went on to agree with the explanation given by Prof. Royce as to the necessity for moral evil in the world—that it would be impossible for a moral being to exist without freedom to choose between right or wrong,—and continued:

"As already said, then, I believe Professor Royce gives a true answer so far as moral evil is concerned, although he misses the emphasis which evolution gives that view. But other evil—physical evil—he gives up, in his book, in despair. And yet, from the point of view of evolution, this is exactly the form of evil that is most explicable. For as moral evil is a necessity for a progressive *moral* being, just so, and far more obviously, is physical evil a necessity for a progressive *rational* being. As one form of evil is closely connected with our *moral* nature, so is the other indissolubly connected with our *intellectual* nature. Let me explain: The necessary condition of *any* evolution is a struggle with an apparently inimical environment. For example:—the end and goal, the significance, the only *raison d'être*, of organic evolution in general, is the achievement of a rational being—man. The necessary condition of that achievement was the struggle with what seemed at every stage an inimical—*i.e.*, evil—environment. But looking back over the course in the light of its glorious result—the achievement of man—we at once see that what seemed evil is really good. Now, it is equally the same with *human* evolution in relation to physical evil. The goal and end, the *raison d'être*, of social progress is the achievement of the *ideal* man—both in knowledge and character. But the attainment of perfect knowledge is impossible, except in the presence of what seems at every stage an evil environment, and by conflict with it. But evidently such an environment is evil only through ignorance of the laws of Nature. Evil is therefore the necessary spur that goads us on to increase of knowledge. We are but foolish little children at school. Nature, our school-mistress, chastises us relentlessly until we get our lessons. It is quite evident that, without this scourge of Evil, humanity would never have emerged out of animality, or, having emerged, would never have emerged beyond the lowest stages. It is also evident that perfect knowledge of the laws of Nature would remove every physical evil. Looking back over the course, then, from the elevated plane of perfect knowledge, and perceiving that the attainment of that plane was conditioned on the existence of evil—on punishment for ignorance—shall we any longer call it evil? Is it not good in disguise?

"But it may be answered, 'Yes, this is all true, if we accept evolution by struggle as a necessary process; but why may not that same result have been attained in some less expensive and distressing way?' I answer, Because, as already seen, no other process is conceivable that would result in a moral being; and the achievement of such a being is the purpose of all evolution. One law, one process, one meaning and purpose, runs through all evolution, and that purpose is only revealed at the end. As, in biology, the laws of *form and structure* are best studied in the lowest organisms, where these are simplest, but those of *function* are studied best in the highest organisms, because only there clearly expressed, just so the laws of *process* in evolution are best understood in its lower and simpler stages; but the *end*, the *purpose and meaning* of the whole process from the begin-

ning, is not fully declared *until* the end. That end is the achievement of a moral being; a moral being without struggle with evil is impossible because a contradiction in terms; and the same law must run throughout.

* * * * *

"Finally, the true conception of God, as it appears to me, and especially in His relation to us, is closely bound up with the absorbing question of immortality. And on this, I surmise that Prof. Royce and I differ; though I am less sure that we do, judging by his hints of what is coming in his more esoteric lectures next week. But in his book he gives up the question of immortality as insoluble by philosophy. Well, perhaps it is; but upon this question, as upon that of evil, I think a great light is thrown by the evolutionary view of the origin of man. . . .

"I assume, then, the immanence of Deity in Nature. Furthermore, as you already know, I regard *physical* and *chemical* forces, or the forces of dead Nature, as a portion of the Omnipresent Divine Energy in a *diffused, unindividuated state*, and therefore *not self-active*, but having its phenomena determined directly by the Divine Energy. Individuation of energy, or self-activity, begins, as I suppose, with Life, and proceeds, *pari passu*, with the organization of matter, to complete itself as a Moral Person in man. . . . God may be conceived as self-sundering His Energy, and setting over against Himself a part as Nature. A part of this part, by a process of evolution, individuates itself more and more, and finally completes its individualization and self-activity in the soul of man. On this view, spirit, which is a spark of Divine Energy, is a potentiality in dead Nature, a germ in plants, a quickened embryo in animals, and comes to birth into a higher world of spirit-life in man. Self-consciousness, from which flows all that is distinctive in man, is the sign of birth into the spiritual world. Thus, an effluence from the Divine Person flows downward into Nature, to rise again by recognition of, and communion with, its own Source.

"Now, observe, and this is the main point: The sole purpose of this self-sundering of the Divine Energy is thereby to have something to contemplate. And the sole purpose of this progressive individuation of the Divine Energy by evolution is finally to have in man something not only to contemplate, but also to love and to be loved by, and, in the ideal man, to love and to be loved by supremely. Thus, God is not only necessary to us, *but we also to Him*. This part of God, self-separated and, as it were, set over against Himself, and including every visible manifestation or revelation of Himself, may well be called a Second Person of the Godhead, which by eternal generation develops into sons of men, and finally into fullness of Godhead in the ideal man—the Divine Man—as his well-beloved Son. By this view there is a new significance to nature. Nature is the womb *in which*, and evolution the process *by which*, are generated sons of God. Now—do you not see?—*without immortality, this whole purpose is balked—the whole process of cosmic evolution is futile*. Shall God be so long at so great pains to achieve a *spirit*, capable of communing with Him, and then allow it to lapse again into nothingness?"

The effect produced by this remarkable address was very powerful. It could not be said to be a demonstration in the strictly logical sense, but those who heard him felt that he had reached out into the outer twilight, beyond the daylight of

reason, and had grasped something more than a shadow. His characteristic power to produce this effect, in handling a difficult subject, was, no doubt, due to his genius for reasoning by analogy. This is commonly admitted to be one of the most dangerous methods of reasoning. But this has always seemed to me to be only another way of saying that only a man of genius is able to discover the true analogy among the thousand seeming analogies that trap the ordinary mortal. Many of the greatest of scientific discoveries have been made by discovering true analogies, even when it was afterwards necessary to corroborate them by the logic of mathematics. It was in this method of reasoning by analogy that Prof. Le Conte was strongest. His long habit of comparative study in zoology, botany and geology had educated a faculty naturally very strong in him to the highest state of efficiency. And the skill with which he used it aroused the admiration of all who heard him. It enabled him to bring out the common ideas in apparently conflicting theories, and to show that these conflicting views were often only partial views of the same truth which could be wholly grasped only by combining them. No one could be associated with him in the class-room without being ever afterwards conscious of a wider and a more generous outlook.

It would be an omission not to mention one of the marked characteristics of genius that Joseph Le Conte possessed in a remarkable degree; that is, openness and flexibility of mind. These qualities he retained to the very last. At seventy-eight his mind was as open to new impressions as that of a little child. His mind never seemed to ossify and harden, as minds often do with age. His greatest work has been in spreading the gospel of evolution. But he was nearly forty-eight before he became a convert to the theory; and yet he put all the enthusiasm of youth into its study, and, when he became convinced of its truth, he showed the same eagerness in its defense. Some of his best work was his last.

While partly natural to him, there is no doubt that a great deal of this flexibility of mind was due to a flexibility of body; for he preserved his powers of body and mind to a much greater age than his brother John. This difference he himself attributes to his early and continued love for athletic exercises

and manly sports, which was much more marked than in his brother.

It was natural that such a man should be a lover of art in all its branches: poetry, the novel, the drama, sculpture, painting, architecture and music. Indeed, he was quite a skilled performer upon the flute, and took the greatest pleasure in all forms of musical composition.

His was a singularly fortunate life. Except for the brief nightmare of the Civil War, it all flowed like one of our Sierra streams, bright and clear from the mountain-tops down through the green pastures.

In many respects his life and character remind one of Mendelssohn. We find the same charm of manner; the same playful fancy and genial, kindly humor; the same high purpose and pure, noble nature; the same harmonious relation to life, and the same sunny cheerfulness of disposition. They were alike fortunate in early home-influences, and were both saved from that rough contact with the world and the too often brutal struggle for existence which crushes the weak, and hardens and deadens the sympathies of the strong. Each was the center of a circle of admirers and devoted disciples. But Mendelssohn was cut off in the flower of his youth, while Le Conte was allowed to live out his useful life to the end.

Mendelssohn found his greatest pleasure in those harmonies which, through the ear, stir the deeps of the human soul. Le Conte loved to study the seeming discords of nature, and to follow the resolution of those jangling chords into the richer harmonies with which the Great Composer gives interest and meaning to the Cosmic Symphony.

It is, perhaps, his greatest triumph that he enabled many thousands of young men to look on life with a new interest, to endure its necessary evils as part of a greater good, and to be content each to play his part, however subordinate, in the firm conviction that it was essential in the Great Symphony. It was as teacher that Joseph Le Conte was greatest; and this was his greatest lesson. When all else that he taught has been forgotten, this conviction will remain in the minds of his hearers, "like the shadow of a tall rock in a thirsty land."

In California his name will always be associated with the Sierras that he loved, and the Yosemite valley, in which he

breathed out his gentle spirit, will henceforth be hallowed ground.

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